

What is claimed is:

- 1 1. In a VCT system having a phaser coupled to a shaft, which can be a driving or driven
2 shaft, an apparatus comprising:

3 the phaser having a rotor irreversibly connected to one end of the shaft free
4 of any region having openings for accommodating independent
5 fastening members, thereby the axial and radial dimension of the
6 apparatus is reduced.
- 1 2. The apparatus of claim 1, wherein the independent fastening members comprise screws.
- 1 3. the apparatus of claim 1, wherein the rotor is irreversibly connected to one end of the
2 shaft by pressing the rotor onto a straight hub; pressing the rotor onto a hub using a
3 straight spline on an inside surface of the rotor and a helical spline on a corresponding
4 surface of the shaft or vice versa; brazing the rotor onto the shaft; swaging the rotor
5 onto the shaft; or ballizing the rotor onto the shaft where the shaft is a hollow component.
- 1 4. The apparatus of claim 1, wherein the rotor is machined as part of the shaft.
- 1 5. In a VCT system having a phaser coupled to a shaft, which can be a driving or driven
2 shaft, an apparatus comprising:

3 a means for irreversibly connecting a rotor of the phaser to one end of the
4 shaft free of any region having openings for accommodating
5 independent fastening members, thereby the axial and radial
6 dimension of the apparatus is reduced.
- 1 6. A method for coupling part of a VCT device to a shaft, comprising the steps of:

2 providing a phaser having a rotor rotating in relation to an opposite part of the
3 phaser, wherein the phaser is axially reduced by eliminating at least one
4 part of the phaser; and

5 irreversibly connecting the rotor to the shaft.

- 1 7. The method of claim 6, wherein the rotor is irreversibly connected to one end of the
2 shaft by pressing the rotor onto a straight hub; pressing the rotor onto a hub using a
3 straight spline on an inside surface of the rotor and a helical spline on a corresponding
4 surface of the shaft or vice versa; brazing the rotor onto the shaft; swaging the
5 rotor onto the shaft; or ballizing the rotor onto the shaft where the shaft is a hollow
6 component.
- 1 8. The method of claim 6, wherein the rotor is machined as part of the shaft.